Mint Classics Company: Comprehensive Inventory and Operations Analysis Report

Role: Junior Data Analyst
Tools Used: MySQL Workbench | SQL

Executive Summary

This project presents an exploratory data analysis (EDA) conducted for Mint Classics Company, a retailer of classic model cars. The objective is to evaluate the feasibility of closing one of the company's storage facilities by analyzing current inventory levels, sales trends, and warehouse efficiency. Through structured SQL queries executed in MySQL Workbench, key insights were drawn from transactional and inventory data to identify overstocked, slow-moving, and unsold products, as well as underutilized warehouse resources.

The analysis revealed:

- Significant inventory imbalances across warehouses.
- A number of unsold or low-performing products consuming space.
- Opportunities for reallocating stock and improving order fulfillment speeds.

Based on these insights, strategic recommendations are provided to help optimize inventory, improve fulfillment performance, and support the cost-effective closure of the South warehouse—the least utilized among the company's storage locations.

Introduction

Mint Classics Company is a growing business specializing in the sale of collectible and classic model vehicles. As part of a cost-reduction initiative, the company seeks to streamline its operations by closing one of its storage facilities while ensuring that customer service—particularly rapid order fulfillment—remains uncompromised.

In this context, the role of a data analyst becomes essential. By leveraging data stored in the company's relational database, analysts can uncover patterns in sales, inventory distribution, and shipping performance. The goal is to determine whether inventory levels are aligned with actual product demand and whether resources can be consolidated without impacting operational efficiency.

This project was conducted using MySQL Workbench and a provided data model, aiming to:

- Understand where inventory is stored and how it is performing.
- Identify slow-moving or stagnant products that could be discontinued.
- Recommend strategies for redistributing or reducing inventory to support the potential closure of a warehouse.

Project Goals

1. **Support Strategic Decision-Making**: Provide data-driven recommendations for the potential closure of one of Mint Classics' storage facilities.
2. **Analyze Inventory and Sales Relationships**: Discover how current inventory levels align with product demand and sales performance.
3. **Identify Optimization Opportunities**: Detect underperforming product lines, overstocked items, and warehouse inefficiencies.
4. **Ensure Service Continuity**: Maintain the ability to fulfill customer orders within 24 hours despite possible warehouse consolidation.
5. **Recommend Cost-Saving Measures**: Help reduce storage and operational costs through inventory reorganization or reduction.

SQL Database Tables – Mint Classics Company

1. customers

- **Purpose: Stores information about customers.**
- **Key Columns:**
  - **customerNumber, customerName, contactLastName, country**
- **Use: Allows customer-level sales or geographic analysis.**

2. employees

- **Purpose**: Contains employee data, including reporting relationships.
- **Key Columns**:
    - employeeNumber, lastName, firstName, jobTitle, reportsTo
- **Use**: Not central to inventory analysis but useful for organizational insights.

3. offices

- **Purpose**: Represents office locations around the world.
- **Key Columns**:
    - officeCode, city, country, phone
- **Use**: Supports regional analysis, ties to employees and customers.

4. orderdetails

- **Purpose**: Line-item details for each order.
- **Key Columns**:
    - orderNumber, productCode, quantityOrdered, priceEach
- **Use**: Used to calculate total sales, revenue, and evaluate product demand.

5. orders

- **Purpose**: Records information about customer orders.
- **Key Columns**:
    - orderNumber, orderDate, requiredDate, shippedDate, status, customerNumber
- **Use**: Vital for analyzing order timelines, fulfillment speed, and shipping efficiency.

6. payments

- **Purpose**: Tracks payments made by customers.
- **Key Columns**:
    - customerNumber, checkNumber, paymentDate, amount
- **Use**: Used in customer-level financial analysis and cash flow tracking.

7. productlines

- **Purpose**: Groups products into broader categories.
- **Key Columns**:
    - productLine, textDescription
- **Use**: Helps segment products for high-level revenue and inventory analysis.

8. products

- **Purpose**: Contains detailed information about the products sold.
- **Key Columns**:
    - productCode, productName
    - productLine, quantityInStock, MSRP, buyPrice, warehouseCode
- **Use**: Core inventory data used for analyzing stock levels, profitability, and storage.

9. warehouses

- **Purpose**: Stores information about company warehouses.
- **Key Columns**:
    - warehouseCode: Unique ID for each warehouse.
    - warehouseName: Name of the warehouse (e.g., East, South).
- **Use**: Helps identify inventory locations and assess warehouse-level performance.

Query Explanations for Mint Classics Company Project

Q1. Where are items stored and how many per warehouse?

- **Shows how many unique products are stored in each warehouse.**
- **Helps identify warehouses with minimal product diversity.**
- **Warehouses with fewer products may be considered redundant.**
- **East warehouse holds the most unique products, while the South warehouse holds the fewest.**

Q2. What is the total quantity of products in stock per warehouse?

- **Calculates total inventory units in each warehouse.**
- **Useful for evaluating which warehouse holds the most/least stock.**
- **Low-volume warehouses may be less critical for operations.**

Q3. Are there any warehouses with significantly lower inventory than others?

- **Ranks warehouses by total inventory in ascending order.**
- **Helps find candidates for closure or redistribution.**
- **A warehouse with significantly less inventory may be phased out.**
- **The South warehouse has the least stock overall.**

Q4. Could inventory from one warehouse be redistributed to others?

- **Analyzes number of product types and quantity per warehouse.**
- **Determines if one warehouse's stock can be distributed elsewhere.**
- **Supports decisions around closing or consolidating facilities.**
- **The South warehouse has both low quantity and variety, making redistribution feasible.**

Q5. What percentage of total inventory does each warehouse hold?

- **Calculates what share of total inventory each warehouse holds.**
- **Warehouses with <20% of total stock are lower priority.**
- **Ideal for identifying underutilized facilities.**
- **South warehouse holds <20% of inventory.**

Q6. Which products have the highest and lowest sales volumes?

- **Identifies products with the most and least total units sold.**
- **High-selling products should be prioritized for restocking.**
- **Low performers can be discontinued or reviewed.**

Q7. Is there any inventory that hasn't been ordered in a long time?

- **Checks when each product was last ordered.**
- **Highlights outdated or declining products.**
- **Candidates for clearance or removal.**

Q8. Are there products with high stock but low sales?

- **Finds products with large stock but low total sales.**
- **These are overstocked and slow-moving items.**
- **Key targets for markdown or removal.**

Q9. What is the average quantity ordered per product vs. quantity in stock?

- **Compares average sales per product against current stock.**
- **Identifies stock-to-demand mismatches.**
- **Guides better procurement and storage planning.**

Q10. Do inventory levels align with product demand?

- **Compares quantity in stock vs. total units sold.**

- **Helps find underperforming or overstocked items.**
- **Useful for restocking or clearance decisions.**

Q11. Which product lines generate the most revenue?

- **Calculates total revenue generated by each product line.**
- **Top revenue lines deserve more stock and marketing.**
- **Guides where to invest resources.**
- **Classic Cars dominate revenue.**

Q12. Are there underperforming product lines?

- **Identifies product lines contributing the least to revenue.**
- **Low-value categories may be reduced or discontinued.**
- **Trains line generates the least revenue.**

Q13. What are the profit margins by product?

- **Calculates profit margins using MSRP and cost price.**
- **Low-margin items may not be worth stocking or promoting.**

Q14. Are some product lines overstocked relative to their sales?

- **Detects product lines with high stock compared to sales.**
- **Indicates over-ordering or declining interest.**
- **Inventory levels should be adjusted accordingly.**

Q14. How many orders are shipped within 24 hours?

- **Measures order fulfillment speed.**
- **24-hour shipment is a customer service goal.**
- **Low count suggests room for process improvement.**
- **50 orders were shipped promptly.**

Q15. Are there any delays in shipping due to stock shortages?

- **Analyzes order statuses like 'On Hold' or 'In Process'.**
- **Indicates fulfillment delays—possibly due to stock shortages.**
- **Critical for service level evaluation.**
- **4 on hold, 6 in process.**

Q16. Which warehouses fulfill the most customer orders?

- **Shows number of customer orders fulfilled per warehouse.**
- **Warehouses with low fulfillment are less critical to business.**
- **Potential candidates for closure or repurposing.**
- **North warehouse fulfills the fewest orders.**

Q17. Which products can be considered for clearance or discontinuation?

- **Combines sales and inventory metrics.**
- **Highlights products with high stock but low sales.**
- **Key for space saving and cost reduction.**
- **44 Products are considered for clearance or discontinuation.**

Q18. Which warehouse is the best candidate for closure?

- **Combines product count, inventory, and order data.**
- **Identifies warehouses with lowest impact if closed.**
- **Supports data-driven consolidation.**
- **South warehouse has low stock and variety, North warehouse has low fulfillment.**

Q19. How much space could be saved by removing slow-moving items?

- **Calculates total inventory volume of low-demand items.**

- **Quantifies potential space savings.**
- **Useful for justifying inventory reduction initiatives.**
- **69598 stock units could be cleared.**

Key Insights from SQL Analysis

- The **South warehouse** has the **lowest inventory volume**, **fewest products**, and **lowest stock variety**—making it a top candidate for closure.
- The **North warehouse** fulfills the **fewest customer orders**, indicating lower operational relevance.
- Certain **product lines (e.g., Trains)** and **products (e.g., 1957 Ford Thunderbird)** contribute **little to sales** and should be reconsidered.
- There are over **44 products** with **low sales and high inventory**, signaling significant **overstocking issues**.
- **High-selling products** like *1992 Ferrari 360 Spider red* should be prioritized for storage in central warehouses for faster fulfillment.
- **Over 69598 stock units** can be cleared by removing slow-moving items.
- Only **50 orders** were shipped within 24 hours, suggesting the system is capable but underoptimized.
- **Delays** due to statuses like "On Hold" or "In Process" may reflect **stock shortages or process issues**.
- The **Classic Cars** product line brings in the **highest revenue**, while **profit margins** vary greatly across products.

Data-Driven Recommendations

1. **Close the South Warehouse**
    - It has the lowest inventory and product diversity. Its stock can be feasibly redistributed to other facilities.
2. **Optimize the North Warehouse**

    - Low order fulfillment suggests inefficiency. Repurpose or scale down its role unless strategic geography demands otherwise.

3. **Clear Overstocked Products**
    - Prioritize removing or discounting the 44+ low-demand, high-stock items to save space and costs.
4. **Rebalance Inventory Based on Sales**
    - Use sales data to set minimum/maximum stock thresholds. Avoid overstocking products with slow movement.
5. **Invest in Top Performing Product Lines**
    - Increase stock levels and promotion of top sellers like *1992 Ferrari 360 Spider red* and *Classic Cars* line.
6. **Phase Out Underperformers**
    - Gradually remove low-margin, low-sales products and weak lines like *Trains*.
7. **Streamline Fulfillment Operations**
    - Improve order handling efficiency to raise the number of 24-hour shipments.

Conclusion

The analysis clearly shows that Mint Classics Company has opportunities to significantly improve efficiency and reduce costs by **closing the South warehouse** and addressing **inventory imbalances**. Overstocked, slow-moving products tie up valuable space and capital, while high-performing lines deserve more focused stocking. Warehouses like the **North**, though not critical by inventory, may be contributing less to operations based on order fulfillment data.

By aligning inventory with real product demand and prioritizing high-margin and fast-selling products, the company can optimize storage, ensure faster shipping, and increase profitability. The SQL analysis provides a solid foundation for informed

business decisions, offering a roadmap to sustainable inventory and warehouse management.